

Page 4-1, line 5, between “DESCRIPTION” and “These” *insert* the following:

“All hot mix asphalt concrete produced shall meet the requirements of §402-1 and the following.”

Page 4-1, under §401-2.02 Composition of Mixtures, Marshall Mix Property Criteria, *delete* the current table and *replace* it with the following table:

MARSHALL MIX PROPERTY CRITERIA

Mix Criteria		
Mix Property	Type 6F and 6 FX	Type 7F and 7FX
Air Voids, %	3.0 - 5.0	3.0 - 5.0
Voids in Mineral Agg. (VMA), %, min.	14.0	16.0
Voids Filled with Binder (VFB), %	65 - 78	65 - 78

Page 4-3

Under §401-2.02, Composition of Mixtures, Composition of Bituminous Plant Mixtures, *delete* the current table and notes and replace them with the following:

“ TABLE 401-1 COMPOSITION OF HOT MIX ASPHALT MIXTURES

Mixture	Base				Binder		Shim		Top ²			
Require- ments ¹	Type 1		Type 2		Type 3		Type 5		Type 6, 6F, 6FX		Type 7, 7F, 7FX	
Screen Sizes	General limits % Passing	Job Mix Tol. %	General limits % Passing	Job Mix Tol. %	General limits % Passing	Job Mix Tol. %	General limits % Passing	Job Mix Tol. %	General limits % Passing	Job Mix Tol. %	General limits % Passing	Job Mix Tol. %
50.0 mm	100	-	100	-	-	-	-	-	-	-	-	-
37.5 mm	90 - 100	-	75 - 100	± 7	100	-	-	-	-	-	-	-
25.0 mm	78 - 95	± 5	55 - 80	± 8	95 - 100	-	-	-	100	-	-	-
12.5 mm	57 - 84	± 6	23 - 42	± 7	70 - 90	± 6	-	-	95 - 100	-	100	-
6.3 mm	40 - 72	± 7	5 - 20	± 6	48 - 74	± 7	100	-	65 - 85	± 7	90 - 100	--
3.2 mm	26 - 57	± 7	2 - 15	± 4	32 - 62	± 7	80 - 100	± 6	36 - 65	± 7	45 - 70	± 6
850 Fm	12 - 36	± 7	-	-	15 - 39	± 7	32 - 72	± 7	15 - 39	± 7	15 - 40	± 7
425 Fm	8 - 25	± 7	-	-	8 - 27	± 7	18 - 52	± 7	8 - 27	± 7	8 - 27	± 7
180 Fm	4 - 16	± 4	-	-	4 - 16	± 4	7 - 26	± 4	4 - 16	± 4	4 - 16	± 4
75 Fm	2 - 8	± 2	-	-	2 - 8	± 2	2 - 12	± 2	2 - 6	± 2	2 - 6	± 2
PGB Content, % ^{3,4}	4.0 - 6.0	±0.4	2.5 - 4.5	±0.4	4.5 - 6.5	±0.4	7.0-9.5	±0.4	5.4 - 7.0	±0.4	5.7 - 8.0	±0.4
PGB ⁵ Grade	PG 64 -22		PG 64 -22		PG 64 -22		PG 64 -22		PG 64 -22		PG 64 -22	
Mixing and ⁶ Placing Temp. Range, °C	120-165		110-150		120-165		120-165		120-165		120-165	

NOTES:

1. All aggregate percentages are based on the total weight of the aggregate. The PGB content is based on the total weight of the mix.
2. The “F” designation in the mix type indicates friction coarse aggregates are required and the “X” designation in the mix type indicates that the more stringent friction aggregate requirements exist. 5
3. When slag aggregates are used in the mix, the PGB content shall be increased accordingly, minimum 25 percent for an all slag mix.
4. The PGB content job mix tolerance of $\pm 0.4\%$ shall not apply to Marshall Design mixtures.
5. For Specified PG 64-22 binder: A PG 64-28 binder may be substituted for the specified PG 64-22 binder at the Contractor’s discretion. 10
6. The PGB shall be introduced into the pugmill at a temperature compatible with that of the aggregate as determined by the Regional Director or the authorized representative, between the limits of 110 °C and 175 °C.”

Page 4-4, lines 15 through 34, under §401-2.03A. Coarse Aggregates, ***delete*** the entire subsection and ***replace*** it with the following: 15

“A. Coarse Aggregates. Coarse aggregates used shall be from approved sources and shall meet one of the following requirements:

1. Limestone having an acid insoluble residue content of not less than 20.0%, excluding particles of chert and similar siliceous rocks. 20
2. Dolomite (excluding Wappinger dolomite, as defined by the Department).
3. Sandstone, granite, chert, traprock, ore tailings, slag or other similar non-carbonate materials. Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.
4. Gravel, or a natural or manufactured blend of the following types of materials: limestone, dolomite (including Wappinger dolomite as defined by the Department), gravel, sandstone, granite, chert, 25 traprock, ore tailings, slag or other similar materials, meeting the following requirements:

For Type 6F mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 6.3 mm particles must be non-carbonate. 30

For Type 7F mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities).

Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.” 35

Page 4-6, line 20, between “Plant” and “The” ***insert*** the following:

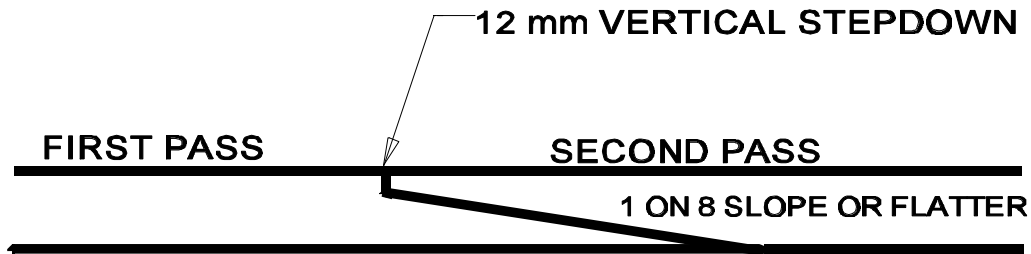
“All hot mix asphalt concrete produced will be measured and adjusted as indicated in §402-4 and the following.”

Page 4-24, Section 401 - Plant Mix Pavements - General:

Under **§401-3.13 Joints**, ***delete*** **B. Longitudinal** and ***replace*** with the following:

“B. Longitudinal. Placement of the surface course shall be carefully planned to ensure that the longitudinal joints in the surface course will correspond with the edges of the proposed traffic lanes. Other

joint arrangements will require approval of the Engineer. When traffic is maintained on the roadway during paving operations the mixture shall be laid such that no more than 30 meters of the longitudinal pavement joint will be exposed at the end of the working day unless a greater length is permitted in the contract documents. If an exposed joint in excess of 30 meters is allowed overnight, it shall not pose a safety hazard to the motoring public, as determined by the Engineer, and warning signs shall be provided 5



TAPERED WEDGE JOINT

at a maximum spacing of 300 meters to alert drivers of the uneven edge. Approval to leave an exposed edge must be requested in writing, in advance of paving operations. If approval is granted to leave a longitudinal pavement joint exposed to traffic the paving operation shall be planned so the edge is only exposed to traffic for one night and is not exposed over weekends or holidays.

When paving adjoining lanes the Contractor shall use the following options:

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Option A - Butt Joint. Under this option the asphalt concrete shall be laid such that it uniformly overlaps the adjacent cold mat 50 to 75 mm. The thickness of the overlap material shall be approximately 1/4 the compacted thickness of the course, so as to result in a smooth and well compacted joint after rolling. The overlapped material shall be broomed or raked back onto the adjacent hot lane so that the roller operator can crowd the small excess into the hot side of the joint. 15

Broadcasting of the overlap material onto the lane is not allowed. If the overlap is excessive, the excess material shall be trimmed off so that the material along the joint is uniform. The coarse particles of aggregate in the overlap material shall be removed and wasted if deemed necessary by the Engineer.

Option B - Tapered Wedge Joint. Under this option the asphalt concrete placed for the first mat shall be laid with an attachment to the paver to provide a sloping wedge with a vertical stepdown at the longitudinal pavement joint. A wedge of material shall extend from the bottom of the stepdown to the existing surface at a slope of 1 on 8 or flatter. Compaction of the first mat shall be done such that the roller compacts up to but does not extend past the stepdown. The vertical stepdown shall be 12 mm, minimum, after compaction of the mat. The second mat shall be placed such that it uniformly overlaps the adjacent cold mat 25 to 40 mm. The thickness of the overlap material shall be approximately 1/4 the compacted thickness of the course, so as to result in a smooth and well compacted joint after rolling. The overlapped material shall be broomed or raked back onto the adjacent hot lane so that the roller operator can crowd the small excess into the hot side of the joint. Broadcasting of the overlap material onto the lane is not allowed. If the overlap is excessive, the excess material shall be trimmed off so that the material along the joint is uniform. The coarse particles of aggregate in the overlap material shall be removed and wasted if deemed necessary by the Engineer. 20 25 30

If permission is granted to expose a longitudinal pavement joint overnight and the joint becomes damaged or provides an unsafe condition for motorists the approval to expose the longitudinal pavement joint will be rescinded by the Engineer and no more than 30 meters of the longitudinal pavement joint can be exposed at the end of the workday.

If a dual drum vibratory roller is used to compact the longitudinal joint constructed using Option A or Option B it shall be operated in vibratory mode and as close to the paver as practicable. The first pass shall be made with the roller traveling toward the paver and operating on the hot mat with 150 to 200 mm of the roller drum protruding onto the cold mat. The roller shall apply a second pass to the joint as it travels back away from the paver. If a single drum vibratory roller with pneumatic drive wheels is used, the roller shall be operated in vibratory mode and the same procedure shall be followed except that the roller shall be aligned on the joint so that the pneumatic drive wheels travel on the joint. All turning movements of the roller shall be done on previously compacted material. After applying two roller passes on the longitudinal joint, the roller shall then proceed to the low side of the lane and compact as described in §401-3.12 **Compaction.**"

Page 4-25, line 27, under **§401-4 METHOD OF MEASUREMENT**, *delete* the entire subsection and *replace* it with the following:

"401- 4 METHOD OF MEASUREMENT. The provisions of §402- 4, Method of Measurement shall apply including the following:

Each delivery vehicle supplying hot mix asphalt production shall be accompanied by a delivery ticket indicating the total quantity in metric tons being delivered. The delivery ticket quantity shall be determined from the automated proportioning system or the delivery vehicle weigh system. The method of determining the delivered quantity shall be subject to the approval of the Regional Materials Engineer. The delivery ticket shall contain the following minimum information:

- A. Delivery Ticket Number
- B. Plant Identification
- C. Contract Number
- D. Material Description, (including the PG-Binder Grade)
- E. Quantity of Material in Vehicle
- F. Date and Time

One legible copy of the delivery ticket shall be made available to the state paving inspector prior to the placement of the mixture."

Page 4-26, line 1, under **§401-5 BASIS OF PAYMENT**, *delete* the entire subsection and *replace* it with the following:

"401- 5 BASIS OF PAYMENT. The provisions of §403-5 shall apply."

Page 4-26, line 4, *replace* **"SECTION 402 (VACANT)** with the following:

"SECTION 402 - QUALITY CONTROL ASPHALT CONCRETE - GENERAL

402-1 DESCRIPTION. This performance related specification applies to the manufacture of all hot mix asphalt utilizing a Quality Control/Quality Assurance system for governing production. Quality Control is defined as all activities required to produce hot mix asphalt that meets all specification requirements. The Contractor, through the hot mix asphalt Manufacturer, is ultimately responsible for all Quality Control activities relating to the production of hot mix asphalt.

The Manufacturer shall produce hot mix asphalt according to specification requirements and provide daily documentation on production quality. Production Quality Adjustment Factors (QAF's) will be used to assess hot mix asphalt production quality and will be applied to calculate a production quality payment adjustment for each days production.

The Department is responsible for Quality Assurance. Quality Assurance is defined as all activities performed by Department personnel to assure that the production of hot mix asphalt meets the specification requirements. The Department will determine a daily production quality payment adjustment for each mixture type by using a daily QAF. QAF's contained in this specification are used to measure production variation from the mean of the specification limits.

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402-2 MATERIALS. The provisions of §401-2, Materials, shall apply unless otherwise specified in the contract plans or proposal and as modified herein. All hot mix asphalt supplied to Department projects shall be produced in accordance with the requirements outlined in this specification, and all applicable Test Methods and Materials Procedures. Hot mix asphalt mixture designs shall be formulated as required and must be acceptable to the Department prior to any project production.

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During production of any mix design assigned verification status or the first production day of the construction season for any mix design assigned production status, a daily QAF of 1.00 will be used providing the required test results yield a daily QAF between 0.90 and 1.00. When the required test results yield a daily QAF greater than 1.00, the actual daily QAF will be used. When the required test results yield a daily QAF less than 0.90, the subject production will be evaluated in accordance with procedures outlined in §402-4, Method of Measurement.

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The Department reserves the right to reject any hot mix asphalt mix design that demonstrates unacceptable quality or exhibits properties that will affect the anticipated performance in accordance with Section 105, Control of Work and Section 106, Control of Material.

402-3 CONSTRUCTION DETAILS. The details of §401-3, Construction Details, shall apply except as modified below:

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402-3.01 Quality Control. The Contractor shall make arrangements with the Manufacturer to provide a production control system to produce hot mix asphalt for Department projects that conforms to all specification requirements.

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The Manufacturer shall sample and test hot mix asphalt prior to acceptance on Department projects. The sampling and testing shall be performed in accordance with procedures approved by the Department. The Manufacturer shall maintain complete records of all Quality Control test results and actions taken. The records shall indicate the nature and type of deficiencies and corrective actions taken. All Quality Control test results shall be documented in a legible manner and provided to the Department. Hot mix asphalt produced without the required sampling, testing and documentation may be rejected.

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A. Control Plan. The Manufacturer shall provide the Regional Materials Engineer with a control plan. The control plan shall outline all phases of the production process and actions necessary to ensure specification conformance. The control plan shall display in organizational form, a list of all personnel associated with the production of the hot mix asphalt. This list shall identify all personnel names and their functions necessary to implement all elements of the Quality Control program. The plan administrator, designated assistant, quality control personnel and phone numbers shall be included. The administration of the control plan shall be the sole responsibility of the Manufacturer. As a minimum, the control plan shall contain the following:

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1. Quality control organizational list.
2. Identification of the plan administrator, designated assistant and quality control personnel.
3. Qualifications and responsibilities of individuals.
4. Lines of communication to the Department.
5. Private testing organization representing the Manufacturer, including services provided.
6. Sampling and testing that ensures process control.
7. A list of all sampling and testing equipment used for process control.
8. Actions and corrective actions that ensures specification conformance.

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The control plan shall be submitted annually to the Regional Materials Engineer for approval a minimum of fifteen working days prior to any hot mix asphalt production. Hot mix asphalt production without an approved control plan will not be allowed. Updates or changes to the control plan, or personnel, must receive prior approval by the Regional Materials Engineer. Control plan guidelines are available from the Regional Materials Engineer.

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The control plan may be operated by the Manufacturer or a private testing organization representing the Manufacturer. If a private testing organization is used to implement all or part of the control plan, the personnel assigned to the production facility site shall be identified on the organizational list.

A separate control plan shall be submitted for each production facility site. When more than one plant is located at a production facility site, only one control plan is required. All plants located at the production facility site must be outlined in the control plan. All sampling and testing equipment used to implement the control plan shall meet the requirements pertaining to the testing procedure. The Department reserves the right to stop production for Department projects in the event the control plan is not followed.

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B. Quality Control Organization.

The quality control organization shall consist of the following:

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1. Plan Administrator. The plan administrator shall be a representative of the Manufacturer and have full authority to institute all actions necessary for the operation of the control plan. The plan administrator is responsible to ensure all requirements of the specification are in conformance. The plan administrator's signature shall be legally binding for the Manufacturer. One plan administrator is allowed to be responsible for multiple production locations. An assistant plan administrator may be designated in the absence of the plan administrator. The plan administrator or assistant must be available to communicate with the Department's representative at all times. The Department reserves the right to stop production for Department projects when the plan administrator or designee is not available.

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2. Quality Control Technician. The Manufacturer shall provide a sufficient number of hot mix asphalt Quality Control Technicians to perform quality control sampling and testing. The Quality Control Technician must possess a current New York State Asphalt Pavement Association Certification for Hot Mix Asphalt Sampling and Testing or its equivalent, as determined by the Director, Materials Bureau. A minimum of one certified Quality Control Technician shall be present at each production facility site. Production facility sites having multiple plants may utilize non-certified Technicians to augment the Certified Technician. Hot mix asphalt production is not acceptable unless the certified Quality Control Technician is present during production. However, the certified Quality Control Technician is not required to be present for production of 150 metric tons or less, if approved by the Regional Materials Engineer. Technicians associated with private testing organizations shall meet the requirements for a Quality Control Technician.

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The Department reserves the right to stop plant production for Department projects in the event unacceptable Technician performance is noted. The Regional Materials Engineer or representative will immediately inform the plan administrator regarding the reasons for stopping plant operations.

The Department may require the Manufacturer to replace unacceptable technicians before plant production is allowed to continue. As a minimum, the certified Quality Control Technician shall be responsible for the following:

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- a. Have knowledge about all plant equipment used for hot mix asphalt production.
- b. Perform all quality control sampling and testing as required.
- c. Document all quality control test results and actions necessary to ensure process control.
- d. Maintain a separate quality control book for each plant.
- e. Document all quality control test results in a legible manner.
- f. Keep quality control test results and plant diary updated on a daily basis.

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402-3.02 Production Facility Laboratory. The Manufacturer shall maintain an approved production facility site laboratory equipped with necessary equipment to perform all required hot mix asphalt sampling and testing. Testing equipment requiring calibration shall be calibrated annually and certified by the

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Manufacturer that all testing equipment meets the required operational tolerances. Verification of the production facility site laboratory and testing equipment will be performed annually by the Department and whenever deemed necessary. Laboratory sampling and testing equipment shall be made available to the Department's Quality Assurance personnel. The requirements under §401-3.02 A.-II, Inspection Facilities shall apply. In addition, the following equipment is required.

A. Maximum Specific Gravity Equipment. Equipment necessary to determine the maximum specific gravity of bituminous paving mixtures. All sampling and testing equipment shall meet the requirements outlined in AASHTO T209, Standard Test Method for Maximum Specific Gravity of Bituminous Paving Mixtures.

B. Bulk Specific Gravity Equipment. Equipment necessary to determine the bulk specific gravity of bituminous paving mixtures. All sampling and testing equipment shall meet the requirements outlined in AASHTO T166, Bulk Specific Gravity and Density of Compacted Bituminous Mixtures using Standard Surface Dry Specimens.

402-3.03 Plant Lots and Sublots. Plant lots and sublots shall be determined on a daily basis using NYSDOT Materials Procedure 94-04M, Testing Frequencies Using Random Sampling at a Hot Mix Asphalt Plant.

A plant lot is defined as the quantity in tons of hot mix asphalt produced per plant for each mix design in one day. When different mix designs are produced on the same day, then each mix design represents a separate plant lot. Plant lots shall be consecutively numbered throughout the production season and start at the beginning of each calendar year's production. Plant lot numbers (i.e., 1-200) will be assigned for each mix design produced and increased by one for each production day. Sublots will be assigned a consecutive letter (A-F) and shall begin with "A" each production day.

Plant lots are subdivided into sublots and are based on the anticipated daily production. A subplot is defined as a portion of a plant lot having a quantity not to exceed 1250 metric tons. When production exceeds a 1250 metric ton subplot, and the excess is not greater than 150 metric tons, the excess will be incorporated into the previous subplot.

Testing is allowed on any portion of a plant lot. However, Quality Control sampling and testing is not required on the first or last 150 metric ton portion of a subplot. This testing exclusion does not apply for sublots greater than 150 but less than 300 metric tons, retest samples or any sample obtained when production has been terminated before the anticipated production for that plant lot. When a subplot is greater than 150 but less than 300 metric tons, the sample shall be obtained from the portion greater than 150 metric tons. If the producer elects to test quantities less than 150 metric tons, this must be indicated in the control plan and applied to all production.

When production stops before a subplot sample is obtained, the untested subplot quantity will be incorporated into the next subplot. If there is no subsequent subplot, the quantity will be incorporated into the previous subplot. If there is no subsequent or previous subplot to incorporate into, the untested subplot quantity shall be considered a plant lot and the QAF for that amount shall be 1.00. Untested subplot quantities will not be incorporated into any subsequent or previous days plant lot production.

When production stops after a subplot sample is obtained and the quantity is less than 1250 metric tons, it is still considered a subplot.

When the anticipated daily plant lot quantity is between 150 metric tons and 500 metric tons, the daily QAF will be 1.00 providing the required quality control sample yields a QAF of 0.90 or greater. If the required test result yields a QAF greater than 1.00, the actual QAF will be used. If the required test result yields a QAF less than 0.90, the subject production will be evaluated in accordance with procedures outlined in §402-4, Method of Measurement. The Manufacturer must notify the Regional Materials Engineer prior to any production of this type.

A. Certified Lot Production. Hot mix asphalt production without the required quality control testing is allowed to be certified for plant lot quantities of 135 metric tons or less. Certified plant lots will have a QAF of 1.00. All certified production shall meet the requirements outlined in this specification.

B. Volumetric Mixture Storage. When volumetric mixtures are stored prior to delivery, the stored quantity will be incorporated into the plant lot associated with the date of delivery. If there is no subsequent production to incorporate into, the stored quantity shall be subject to the requirements outlined in this subsection.

C. Non-Volumetric Mixture Storage. When non-volumetric mixtures are stored prior to delivery, the stored quantity will be incorporated into the plant lot associated with the date of manufacture. The lot number and daily QAF determined during production will be associated with the stored quantity. 5

D. Night Production. During night production the contractor has the option to associate plant lots as outlined in this subsection or when plant employee shift change occurs. The Regional Materials Engineer must be notified which option will be used at least one day prior to any production of this type. 10

402-3.04 Quality Control Sampling and Testing. Quality control samples shall be obtained as outlined in NYSDOT Materials Procedure 94-04M, Testing Frequencies Using Random Sampling at a Hot Mix Asphalt Plant.

Quality control sampling and testing shall be performed by Quality Control Technicians meeting the requirements outlined in §402-3.01 B. 2, Quality Control Technician. 15

Quality control testing procedures will be verified by the Department on a random basis by split sample testing. The Manufacturer's quality control samples shall be split into two representative samples and individually tested by the Manufacturer and the Department. The Department's test results will be compared to the Manufacturer's test results.

When the split sample test results are within the allowable tolerances as outlined in Table 402-1, Allowable Testing Tolerances, the Manufacturer's quality control test results representing the plant lot quantity will be used to determine the daily QAF. 20

When the test results of the split sample exceeds the allowable tolerances, retesting of the subject material shall be performed. When the test results of the retest split sample are within the allowable tolerances, the Manufacturer's quality control test results representing the plant lot will be used to determine the daily QAF. 25

When the test results of the retest split sample exceeds the allowable tolerances, production for Department projects shall be terminated and all the Manufacturer's quality control test results representing the production up to this point will be used to determine the daily QAF. Production for Department projects will not be allowed until the Regional Materials Engineer is satisfied that the cause of the verification problem has been resolved. 30

**TABLE 402-1
ALLOWABLE TESTING TOLERANCES**

Test Property	Tolerance	
	Within Lab	Lab to Lab
Gradation \$ 425 Fm Sieve	± 5.0 %	± 7.0 %
Gradation < 425 Fm Sieve	± 2.0 %	± 3.0 %
Bulk Specific Gravity	± 0.020	± 0.028
Maximum Specific Gravity	± 0.011	± 0.019

Retesting of split samples shall be performed on the day the plant lot material was produced or delivered. If production has been terminated for any reason, the retesting shall be performed during initial production of the next plant lot. When there is no future production, the subject material shall be considered a plant lot and the daily QAF shall be 1.00. 40

During the required quality control sampling and testing, the Manufacturer shall obtain a hot bin or composite aggregate split sample representative of the quality control sample. A minimum of one aggregate

split sample shall be obtained per day for each mix type produced. The aggregate split sample shall be reduced to testing size, identified and retained at the production site for a minimum of ten production days. The retained aggregate split samples shall be identified as to plant lot, subplot, and mix type. Hot bin aggregate samples shall be packaged separately by hot bin and retained together. Composite aggregate samples shall be dried before packaging.

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All required compacted hot mix specimens, including the maximum specific gravity samples shall be retained at the production site for a minimum of ten production days. The compacted specimens and gravity samples shall be identified as to the plant lot, subplot, and mix type. The compacted specimens and the gravity samples shall be air dried and packaged.

All retained aggregate samples, compacted specimens and gravity samples may be discarded at the end of the specified time period, unless otherwise directed by the Regional Materials Engineer.

The Department reserves the right to witness any or all quality control sampling and testing, and test any or all retained samples for specification conformance.

Sampling and testing shall be performed using test procedures and frequencies outlined in the following Table 402-2, Quality Control Sampling and Testing.

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**TABLE 402-2
QUALITY CONTROL SAMPLING AND TESTING**

Test Property	Sample Location	Test Method	Quality Control Frequency
Aggregate Gradation	NYSDOT MM 5.0	AASHTO T27 MM 5.0	(1)
Aggregate Moisture (2)	NYSDOT MM 5.0	NYSDOT MM 5.0	1 Every other Sublot Minimum 2 Per Day
Air Voids Plant Mixture (3)	NYSDOT MM 5.0	AASHTO T166 & T209 MM 5.13M / MM 5.16M	1 Per Sublot
Wet Analysis Minus 75Fm sieve	(4)	AASHTO T11	1 Per Week
Plant Mixture Moisture (2), (5)	NYSDOT MM 5.0	NYSDOT MM 5.0	As Required
Plant Mixture Temperature	Plant and Haul Vehicle	N/A	Routinely, Minimum 4 Times Per Day
Plant Mixture Asphalt Content	NYSDOT MM 5.0	NYSDOT MM 5.0	Routinely, Minimum 4 Times Per Day/Mix
RAP Moisture	NYSDOT MM 5.0	NYSDOT MM 5.0	2 Per Week
RAP Extraction	NYSDOT MM 5.0	NYSDOT MM 5.0	2 Per Week
Asphalt Cement Sampling (6)	NYSDOT MM 5.0	N/A	2 Per Day
Friction Aggregate Sampling	NYSDOT MM 28	NYSDOT MM 28	As outlined in MM 28

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Notes:

- (1) **Volumetric design mixes** - one test every other subplot, minimum one per day.
Non -Volumetric design mixes - one test every subplot.
- (2) Required for drum mix plant only.
- (3) Required for volumetric design mixes.
- (4) Batch plant hot bins and drum mix plant composite sample.
- (5) Required for batch and drum mix plants when producing recycled mixes.
- (6) Department will be responsible for sample submission.

A. Sampling. Quality control samples for aggregate and hot mix asphalt shall be obtained randomly using the procedures outlined in NYSDOT Materials Procedure 94-04M, Testing Frequencies Using Random Sampling at a Hot Mix Asphalt Plant. Other required quality control samples shall be obtained as outlined below in B., Testing, and Table 402-2, Quality Control Sampling and Testing.

B. Testing. The Manufacturer shall perform all quality control testing as outlined below:

1. Aggregate Gradation. The aggregate gradation analysis shall be determined using the procedures outlined in NYSDOT Materials Method 5.0, Plant Inspector's Manual for Bituminous Concrete Mix Production. Aggregate gradations for any mix type are considered in control when all quality control sieve test values remain within the Job Mix Formula tolerances.

a. Volumetric Design Mixes. An aggregate gradation analysis shall be performed every other subplot of hot mix asphalt produced. A minimum of one analysis per day shall be performed for each mix design produced.

b. Non-Volumetric Design Mixes. An aggregate gradation analysis shall be performed every subplot for each hot mix asphalt mix design produced.

2. Determination of Material Finer than the 75Fm Sieve. Material finer than the 75µm sieve shall be determined in accordance with the procedures outlined in AASHTO T11, Standard Test Method for Materials Finer than 75µm Sieve in Mineral Aggregates by Washing. The material finer than the 75Fm sieve shall be determined for each production plant a minimum of one per week. The analysis shall be performed on the batch plant fine hot bin and the drum mix plant composite sample. Sampling of batch plant coarse aggregate hot bins will be required and/or the testing frequency modified for the fine hot bin if deemed necessary by the Regional Materials Engineer.

3. Air Void Analysis - Volumetric Design Mixes. Air void analysis shall be determined for each subplot of volumetric design hot mix asphalt produced. The air void analysis shall be determined on the hot mix asphalt obtained from the haul vehicle. When hot mix asphalt holding bins are used for standard storage times as outlined in §401-3.03, Hot Bituminous Mixture Holding Bins, the air void analysis shall be determined after the storage time. The air void analysis shall be determined using the procedures outlined in NYSDOT Materials Method 5.13M or 5.16M. The Materials Method used will depend upon the type of mix design specified in the contract documents. In conjunction with the air void analysis, the Voids in Mineral Aggregate (VMA) and Voids Filled with Asphalt (VFA) shall be determined.

4. Determination of Asphalt Content. The asphalt content shall be determined using the procedures outlined in NYSDOT Materials Method 5.0, Plant Inspector's Manual for Bituminous Concrete Mix Production. The asphalt content shall be calculated during initial production and then routinely throughout production a minimum of four times per day per mix type.

5. Mixture Temperature. The mix temperature shall be determined at the beginning of production with the first or second haul vehicle and then routinely throughout the production day. A minimum of four temperatures shall be determined per day independent of mix type. The temperature shall be transmitted to the project paving site with the haul vehicle delivery ticket. When hot mix asphalt holding bins are loaded for storage, the mix temperature shall be determined routinely throughout the loading time.

6. Aggregate and Mix Moisture Content (Drum Mix Plant). The aggregate and hot mix asphalt moisture shall be determined using the procedures outlined in NYSDOT Materials Method 5.0. The composite aggregate moisture content shall be determined daily during initial production and then mid-way throughout the production day. A minimum of two aggregate moisture contents shall

be determined per day. The hot mix asphalt moisture content shall be determined as deemed necessary by the Regional Materials Engineer.

7. Asphalt Cement Sampling. The Manufacturer shall obtain samples of the asphalt cement in accordance with the procedures outlined in NYSDOT Materials Method 5.0. A minimum of two samples shall be obtained each production day. All samples shall be appropriately identified and stored at the facility site. Sample containers, documentation and submission of the samples will be the Department's responsibility. 5

8. Friction Aggregate. The friction coarse aggregate must meet the requirements outlined in §401-2.03 A., Coarse Aggregates. The Manufacturer shall perform friction coarse aggregate sampling and testing using procedures outlined in NYSDOT Materials Method 28, Friction Aggregate Control and Test Procedure. The friction coarse aggregate test procedure shall be performed at the production facility at frequencies outlined in Materials Method 28. 10

9. Recycle Mixes. The Manufacturer shall perform all sampling and testing of hot mix asphalt containing reclaimed asphalt pavement using procedures outlined in NYSDOT Materials Method 5.0. Quality control testing frequencies for recycle mix production shall be followed as outlined in §402-3.04, Quality Control Sampling and Testing, except the following tests shall be performed at frequencies outlined in NYSDOT Materials Method 5.0 and Table 402-2, Quality Control Sampling and Testing. 15

- a. RAP Moisture Test
- b. RAP Extraction Test 20
- c. Recycle Mix Moisture Test

C. Air void and Gradation Reporting. Air void control test values shall be calculated to the nearest 0.001 of a percent and reported to the nearest 0.01 of a percent. Aggregate gradation control test values shall be calculated to the nearest 0.01 of a percent and reported to the nearest 0.1 of a percent. When determining test result acceptability, the air void test value shall be referenced to the mix design median of 4.00 percent and the gradation test value referenced to the Job Mix Formula target value. 25

D. Sampling and Testing Disputes. When sampling and testing disputes occur, the Department will perform referee sampling and testing. Referee samples will be obtained randomly and independently from the quality control samples and tested at the Regional or Central Office laboratory. If production has been terminated, the Manufacturer's retained samples representing the disputed plant lot will be tested. The Department's independent referee test results are final and will be used to determine the daily QAF for the disputed quantity and the acceptance of the in place production material. 30

402-3.05 Production Control. During production the Manufacturer is allowed to make process control adjustments providing the mix design target values are strived for. However, target value adjustments are allowed providing the target value remains within the specification general limits and the adjustments are properly documented in the plant diary. Only the aggregate gradation production tolerance is allowed to exceed the general limits. Adjustments to any volumetric design target value will only be allowed providing all specified volumetric mix properties remain within the specification production limits. When any test value consistently falls outside the allowable production tolerance, corrective actions must be taken. The Regional Materials Engineer must be notified prior to production of any subsequent adjusted subplot. 40

The Manufacturer may terminate production at any time. The Manufacturer shall immediately notify the Project Engineer and the Regional Materials Engineer when production is terminated. When the Manufacturer terminates production, the hot mix asphalt quantity produced up to that point will be considered a plant lot and the daily QAF will be determined using all the required quality control test values and any additional test values obtained from the terminated plant lot. Hot mix asphalt in storage from any terminated plant lot having a QAF less than 0.90, or any required testing not in conformance with the specification requirements is considered unacceptable for Department projects. 45

When production of any mix type consistently yields a daily QAF less than 0.94, the mix design may be rejected. When the daily QAF of any mix type is less than 0.90 for two consecutive production days, corrective actions must be taken. If by the end of the third production day, corrective actions did not yield a daily QAF of 0.90 or greater, production of that mix shall be terminated. When production is terminated under these conditions, the Manufacturer shall demonstrate by trial production that the production process yields a QAF of 0.90 or greater. The Manufacturer shall immediately notify the Regional Materials Engineer when production yields a daily QAF less than 0.90. 50

A. Mixing Plant Control. The provisions of §401-3.02 through §401-3.03 shall apply including the following:

All mix production will be in the automatic mode. Any material produced in a non-automatic mode shall not be shipped and the Regional Materials Engineer notified immediately. Material produced in the automatic mode that exceeds twice the production tolerance will not be shipped. Material produced in the automatic mode that is between the single and double production tolerance may be shipped, however, the Regional Materials Engineer will determine after review of the printed production records if the material is acceptable to the Department.

During production, all recordation prints must indicate the mix type being produced as well as an indication as to which holding bin is being charged by the mix.

402-3.06 Production Quantities. The Manufacturer shall notify the Regional Material's office by 3:00 PM on the day before any production for the Department.

The Manufacturer shall maintain a record of each days production quantity for each mix design supplied to the project site. These quantities must be tabulated on a daily basis, retained at the production facility and made available to the Department for review. All production quantities shall be transmitted to the project site. Each delivery vehicle supplying hot mix asphalt shall be accompanied by a delivery ticket indicating the total quantity in metric tons being delivered. The delivery ticket quantity shall be determined from the automated proportioning system or the delivery vehicle weigh system. The method of determining the delivered quantity shall be subject to the approval of the Regional Materials Engineer. The delivery ticket shall contain the following minimum information:

- A. Delivery Ticket Number
- B. Plant Identification
- C. Contract Number
- D. Material Description, (including the PG-Binder Grade and an indication of which holding bin the material was drawn from)
- E. Quantity of Material in Vehicle
- F. Date and Time

One legible copy of the delivery ticket shall be made available to the state paving inspector prior to the placement of the mixture.

402-3.07 Documentation. The Manufacturer will maintain at each plant facility all process control test data. The test data must be kept in a ringed type book and stored in the production facility laboratory. Test data must be updated in this book within 24 hours following each plant lot production. As a minimum, the book must contain the control plan, job mix formulas, design target values, test data summaries, and daily production quantities. All forms, except control charts will be supplied by the Department. Test data must be documented on NYSDOT Form BR-331M, Production Summary Sheet. A separate Production Summary Sheet shall be used for each mix design produced. All production process control actions shall be outlined in the plant diary. A summary of all test data shall be transmitted weekly to the Regional Materials Engineer.

A copy of the plant automation printout for each mix type produced shall be kept at the plant facility site and must be available for review at all times.

Air void control charts shall be plotted for each volumetric mix type and posted in the laboratory or kept in a separate book. All control charts must be updated within a 24 hour period. As a minimum, the following production actions shall be documented:

- A. Date and time of test sample
- B. Gradation analysis
- C. Wet analysis of material finer than 75Fm sieve
- D. Air void analysis
- E. Aggregate and hot mix asphalt moisture content
- F. Asphalt content
- G. Production mix temperature
- H. Lot and subplot identification
- I. Random sample test location
- J. Itemized daily production project quantities
- K. Friction aggregate test results
- L. Voids in Mineral Aggregate (VMA) and Voids Filled with Asphalt (VFA)

402-4 METHOD OF MEASUREMENT. The provisions of §401-4 and §403-4, Method of Measurement, shall apply including the following:

The Manufacturer shall determine each day the production quantity of each plant lot. The quantity shall be measured by the number of actual metric tons produced at the plant facility. The quantity shall be determined from the automated proportioning system or the delivery vehicle weigh system. The quantity shall be measured or calculated based on the measured amount and reported to the nearest 0.01 of a metric ton.

The Department will determine a daily QAF for each days production from either Table 402-3, Air Voids in Plant Mixture (Volumetric Designs) or Table 402-4, Percent Passing (Non-Volumetric Designs). The daily QAF will be used to calculate the quality payment adjustment for each days production.

TABLE 402-3
AIR VOIDS IN PLANT MIXTURE (Volumetric Designs)

Quality Adjustment Factor	Average Absolute Value of (Test Value - 4.0)
1.05	0.00 - 0.17
1.04	0.18 - 0.33
1.03	0.34 - 0.50
1.02	0.51 - 0.67
1.01	0.68 - 0.83
1.00	0.84 - 1.00
0.99	1.01 - 1.10
0.98	1.11 - 1.20
0.97	1.21 - 1.30
0.96	1.31 - 1.40
0.95	1.41 - 1.50
0.94	1.51 - 1.60
0.93	1.61 - 1.70
0.92	1.71 - 1.80
0.91	1.81 - 1.90
0.90	1.91 - 2.00
0.85 (1)	over 2.00

(1) Refer to §402-4, Method of Measurement.

Quality payment adjustment for volumetric design mixtures is based on plant mixture air voids. Quality payment adjustment for non-volumetric design mixtures is based on plant mixture aggregate gradation.

The daily QAF for volumetric design mixtures is obtained from Table 402-3, Air Voids in Plant Mixture. When hot mix asphalt holding bins are used for volumetric design mixtures, the daily QAF for the stored mixture will be determined on the day of delivery.

The daily QAF for non-volumetric design mixtures will be calculated for all Job Mix Formula sieves having design target values less than 90 percent passing. The daily QAF for non-volumetric design mixtures shall be the lowest factor obtained from Table 402-4, Percent Passing, unless each individual QAF is 1.00 or greater. If each individual QAF is equal to or greater than 1.00, the highest calculated QAF will be used.

When the daily QAF for any plant production material is less than 1.00, the Contractor has the option to remove and replace the subject material at no cost to the Department or agree to accept the adjustment in payment.

When the daily QAF for any plant production material is less than 0.90, the subject material will be evaluated by the Department to determine if it will be left in-place. The type of material produced, the layer in which it was used and the location of use will be the primary considerations for determining whether the subject material is left in-place. If the subject material is left in-place, a daily QAF of 0.85 will be used to calculate the quality payment adjustment. If the subject material is not left in-place, it shall be removed and replaced at no cost to the Department.

When material is removed and replaced by the Contractor, the daily QAF for the replaced material will be determined as outlined in this subsection.

The daily QAF applies to all production quantity deemed acceptable by the Engineer.

402-5 BASIS OF PAYMENT. The provisions of §403-5, Basis of Payment shall apply.

TABLE 402-4
PERCENT PASSING (Non - Volumetric Designs)

Quality Adjustment Factor	Average Absolute Value of (Test Value - JMF Target Value)		
	Sieve Size 425Fm and Larger	Sieve Size 180Fm	Sieve Size 75Fm
1.05	0.0 - 0.8	0.0 - 0.5	0.0 - 0.3
1.04	0.9 - 1.5	0.6 - 1.0	0.4 - 0.5
1.03	1.6 - 2.3	1.1 - 1.5	0.6 - 0.8
1.02	2.4 - 3.0	1.6 - 2.0	0.9 - 1.0
1.01	3.1 - 4.5	2.1 - 3.0	1.1 - 1.5
1.00	4.6 - 6.0	3.1 - 4.0	1.6 - 2.0
0.99	6.1 - 6.3	4.1 - 4.2	2.1
0.98	6.4 - 6.6	4.3 - 4.4	2.2
0.97	6.7 - 6.9	4.5 - 4.6	2.3
0.96	7.0 - 7.2	4.7 - 4.8	2.4
0.95	7.3 - 7.4	4.9 - 5.0	2.5
0.94	7.5 - 7.8	5.1 - 5.2	2.6
0.93	7.9 - 8.1	5.3 - 5.4	2.7
0.92	8.2 - 8.4	5.5 - 5.6	2.8
0.91	8.5 - 8.7	5.7 - 5.8	2.9
0.90	8.8 - 9.0	5.9 - 6.0	3.0
0.85 (1)	over 9.0	over 6.0	over 3.0

(1) Refer to §402-4, Method of Measurement."

Page 4-26, line 5, **delete** SECTION 403 - HOT MIX ASPHALT CONCRETE PAVEMENT, in its entirety and **replace** it with the following:

"SECTION 403 - HOT MIX ASPHALT CONCRETE PAVEMENT

403-1 DESCRIPTION. This work shall consist of constructing a pavement course of plant-mixed hot mix asphalt concrete (HMA) on a prepared base in accordance with contract documents and in reasonable close conformity with the required lines, grades, thickness and typical sections shown on the plans or established by the Engineer.

403-2 MATERIALS. The provisions of §401-2.01 through 401-2.06 shall apply except that, friction aggregates are not required in mixtures placed on shoulders unless otherwise specified in the contract plans or proposal.

403-3 CONSTRUCTION DETAILS. The provisions of §401-3.01 through §401-3.15 and §402-3.01 through §402-3.07 shall apply.

403-4 METHOD OF MEASUREMENT. The provisions of §401-4 and §402-4 shall apply including the following:

Quality payment adjustments are applicable for all hot mix asphalt in accordance with the specifications herewith and the provisions outlined in the contract proposal. All quality payment adjustments are measured in Quality Units. Quality Units will be determined for each days production by using the daily Quality Adjustment Factor (QAF) for plant production, pavement density, longitudinal joint density and pavement smoothness and the appropriate tons accepted by the Engineer. 5

Quality Units = (Quality Adjustment Factor - 1.00) x Appropriate Accepted HMA Tons 10

403- 5 BASIS OF PAYMENT. The unit bid price per ton for all pavement courses shall include the cost of furnishing all materials including any cleaning and tack coat applied pursuant to §401-3.01, and all equipment and labor necessary to complete the work. In addition, Quality Units may apply to the hot mix asphalt items as calculated in §403-4. Payment of Quality Units will be made based on the Index Price listed in the contract documents. The index price shown in the itemized proposal for each Quality Unit shall be considered the price bid. The unit (index) price is NOT to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figure will be disregarded and the original price will be used to determine the total amount bid for the Contract. 15

Payment will be made under:

Item No.	Item	Pay Unit	
403.110001 M	Asphalt Concrete - Type 1 Base Course	Metric Ton	
403.110010 M	Plant Production Quality Adjustment to 403.110001 M	Quality Unit	
403.120001 M	Asphalt Concrete - Type 2 Base Course	Metric Ton	
403.120010 M	Plant Production Quality Adjustment to 403.120001 M	Quality Unit	
403.130001 M	Asphalt Concrete - Type 3 Binder Course	Metric Ton	25
403.130010 M	Plant Production Quality Adjustment to 403.130001 M	Quality Unit	
403.150001 M	Asphalt Concrete - Type 5 Shim Course	Metric Ton	
403.150010 M	Plant Production Quality Adjustment to 403.150001 M	Quality Unit	
403.160001 M	Asphalt Concrete - Type 6 Top Course	Metric Ton	
403.160010 M	Plant Production Quality Adjustment to 403.160001 M	Quality Unit	30
403.170001 M	Asphalt Concrete - Type 6F Top Course (Friction) Marshall Design	Metric Ton	
403.170010 M	Plant Production Quality Adjustment to 403.170001 M	Quality Unit	
403.180001 M	Asphalt Concrete - Type 7 Top Course	Metric Ton	
403.180010 M	Plant Production Quality Adjustment to 403.180001 M	Quality Unit	35
403.190001 M	Asphalt Concrete - Type 7F Top Course (Friction) Marshall Design	Metric Ton	
403.190010 M	Plant Production Quality Adjustment to 403.190001 M	Quality Unit	
403.210001 M	Asphalt Concrete - Truing and Leveling Course	Metric Ton	
403.210010 M	Plant Production Quality Adjustment to 403.210001 M	Quality Unit"	40

Page 4-29, line 20, **insert** "Pavement" after "Bituminous"

Page 4-30, line 10, **insert** "or" between "surface" and "when"

Page 4-39, line 22, **insert** "of Bituminous" after "Milling"